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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,456	09/01/2006	Hiroshi Ogura	071971-0730	2324

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EXAMINER	
ELBIN, JESSE A	

ART UNIT	PAPER NUMBER
2615	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,456	OGURA ET AL.	
	Examiner	Art Unit	
	JESSE A. ELBIN	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01 September 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because of the following informalities: the phrase "silicon oxide" used throughout the specification does not use proper chemical nomenclature. For the purposes of the art rejection below, "silicon oxide" will be interpreted as "silicon dioxide".

Appropriate correction is required.

Claim Objections

3. Claims 2-3 and 7-8 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 2-3 and 7-8 cite only limitations drawn to the method of manufacturing the electret condenser of claims 1 and 6 respectively. The method of manufacturing the electret condenser does not alter the structural limitations already expressed in claims 1 and 6.

4. Claims 2 and 7 are objected to because the phrase "silicon oxide" does not use proper chemical nomenclature. For the purposes of the art rejection below, "silicon oxide" will be interpreted as "silicon dioxide". Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Chang (US PGPub 2004/0114775 ('775))

Regarding claim 1, Chang teaches an electret condenser (condenser microphone; '775 title), comprising: a first electrode (backplate; Fig. 3I #54); a second electrode (electrode metal layer; Fig. 3I #51); a first insulating film (silicon nitride layer; Fig. 3G #522) which is formed between the first electrode (Fig. 3I #54) and the second electrode (Fig. 3I #51) and is electretized ("The silicon nitride layer 522 is charged so as to be formed into an electret"; [0018] lines 9-12); and a second insulating film (silicon dixoide layer; Fig. 3G #521) formed so as to cover the first insulating film (Fig. 3C),

wherein the first insulating film covered with the second insulating film is formed on the second electrode (Fig. 3G).

Regarding claim 4, Chang remains as applied above.

Chang further teaches the second electrode (Fig. 3I #51), the first insulating film (Fig. 3G #522), and the second insulating film (Fig. 3G #521) compose a vibrating film (diaphragm; Fig. 3G #52).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 2-3 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US PGPub 2004/0114775 ('775)).

Regarding claim 2, Chang remains as applied above.

Examiner takes official notice that the temperature range used to grow a silicon [dioxide] layer is well known in the art. Growing silicon [dioxide] on a semiconductor is commonly done at various temperatures depending on the required growth rate. Therefore it would have been obvious to one of ordinary skill in the art, with a minimal amount of experimentation, to grow a silicon dioxide film in the temperature range of 500 °C to 800 °C depending on the rate at which the design requires the film to be grown.

Regarding claim 3, Chang remains as applied above.

Examiner takes official notice that the temperature range used to grow a silicon nitride layer is well known in the art. Growing silicon nitride on a semiconductor is commonly done at various temperatures depending on the required growth rate. Therefore it would have been obvious to one of ordinary skill in the art, with a minimal amount of experimentation, to grow a silicon nitride film in the temperature range of 600 °C to 800 °C depending on the rate at which the design requires the film to be grown.

Regarding claim 6, Chang teaches an electret condenser (condenser microphone; '775 title), comprising: a first electrode (backplate; Fig. 3l #54); a second

electrode (electrode metal layer; Fig. 3I #51); a first insulating film (silicon nitride layer; Fig. 3G #522) which is formed between the first electrode (Fig. 3I #54) and the second electrode (Fig. 3I #51) and is electretized ("The silicon nitride layer 522 is charged so as to be formed into an electret"; [0018] lines 9-12); wherein the first insulating film (Fig. 3G #522) is covered with the second electrode (Fig. 3I #51) and a second insulating film (silicon dioxide layer; Fig. 3g #521)

Change does not explicitly teach the second electrode being made of polysilicon.

Examiner takes official notice that creating a conductor with polysilicon is well known in the art. Polysilicon layers can be created through typical semiconductor processes and do not require additional metallization processes. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to create the electrode metal layer as taught by Change out of polysilicon.

Regarding claim 7, Chang remains as applied above.

See rejection of claim 2 above, where examiner took official notice that the temperature used to grow silicon [dioxide] is well known in the art.

Regarding claim 8, Chang remains as applied above.

See rejection of claim 3 above, where examiner took official notice that the temperature used to grow silicon nitride is well known in the art.

Regarding claim 9, Chang remains as applied above.

Chang further teaches the second electrode (Fig. 3I #51), the first insulating film (Fig. 3G #522), and the second insulating film (Fig. 3G #521) compose a vibrating film (diaphragm; Fig. 3G #52).

10. Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US PGPub 2004/0114775 ('775)) as applied to claims 4 and 9 above, and further in view of Loeppert (US Patent 5,490,220 ('220)) (already of record).

Regarding claim 5, Chang remains as applied above.

Chang does not explicitly teach the shape in plan of the first insulating film (connecting layer #44) is smaller than a shape in plan of the vibrating film (Fig. 2 #12), and the first insulating film is arranged at a central part of the vibrating film (Fig. 2).

In the same field of endeavor, Loeppert teaches the shape in plan of the first insulating film (connecting layer #44) is smaller than a shape in plan of the vibrating film (Fig. 2 #12), and the first insulating film is arranged at a central part of the vibrating film (Fig. 2) to maximize the sensitivity of the microphone and minimize parasitic capacitances.

While Loeppert teaches the connecting layer #44 is made of chrome/gold metal, it serves the same purpose as the first insulating film taught by Chang and is therefore a structural equivalent.

As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to limit the size of the electret (first insulating film) as taught by Chang to

the center of the vibrating diaphragm as taught by Loeppert in order to maximize sensitivity of the microphone and minimize parasitic capacitances.

Regarding claim 10, Chang remains as applied above.

See rejection of claim 5 above.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Dehe et al. (US PGPub 2004/0259286) teaches a MEMS sensor using a polysilicon diaphragm.

b. Hsieh et al. (US PGPub 2005/0254673) teaches a high performance MEMS electret microphone.

c. Tai et al. (US PGPub 2001/0033670) teaches a thin film electret microphone.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE A. ELBIN whose telephone number is (571)270-3710. The examiner can normally be reached on Monday through Friday, 8:00am to 5:00pm EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Suhan Ni can be reached on (571) 272-7505. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. A. E./
Examiner, Art Unit 2615

/Suhan Ni/
Primary Examiner, Art Unit 2614